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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants:	Darren D. NEUMAN	§	Confirmation No.:	7152
Serial No.:	09/281,365	§	Group Art Unit:	2644
Filed:	March 30, 1999	§	Examiner:	Ping LEE
For:	Audio Calibration System	§	Attorney Docket No.:	5201-19401

APPEAL BRIEF

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

March 19, 2004

Dear Sir:

This paper is submitted pursuant to applicants' timely filed Notice of Appeal, filed January 22, 2004. In particular, applicants appeal the examiner's final rejection of claims 1-4, 6-14, 16-18, 20 and 21 as set forth in the Final Office Action of December 1, 2003.

This paper includes the following sections:

REAL PARTY IN INTEREST

The real party in interest is the Assignee: LSI Logic Corporation.

RELATED APPEALS AND INTERFERENCES

No other appeals or interferences are known to the Applicant, the Applicant's legal representative, or the Assignee that will directly affect or be directly affected by or have a bearing on the Board's decision in an appeal on this case.

STATUS OF CLAIMS

Originally filed claims:	1-24
Canceled claims:	5, 15, 19 and 22-24
Presently pending claims:	1-4, 6-14, 16-18, 20 and 21
Allowed claims:	None
Rejected claims:	1-4, 6-14, 16-18, 20 and 21

STATUS OF AMENDMENTS

No amendments are pending.

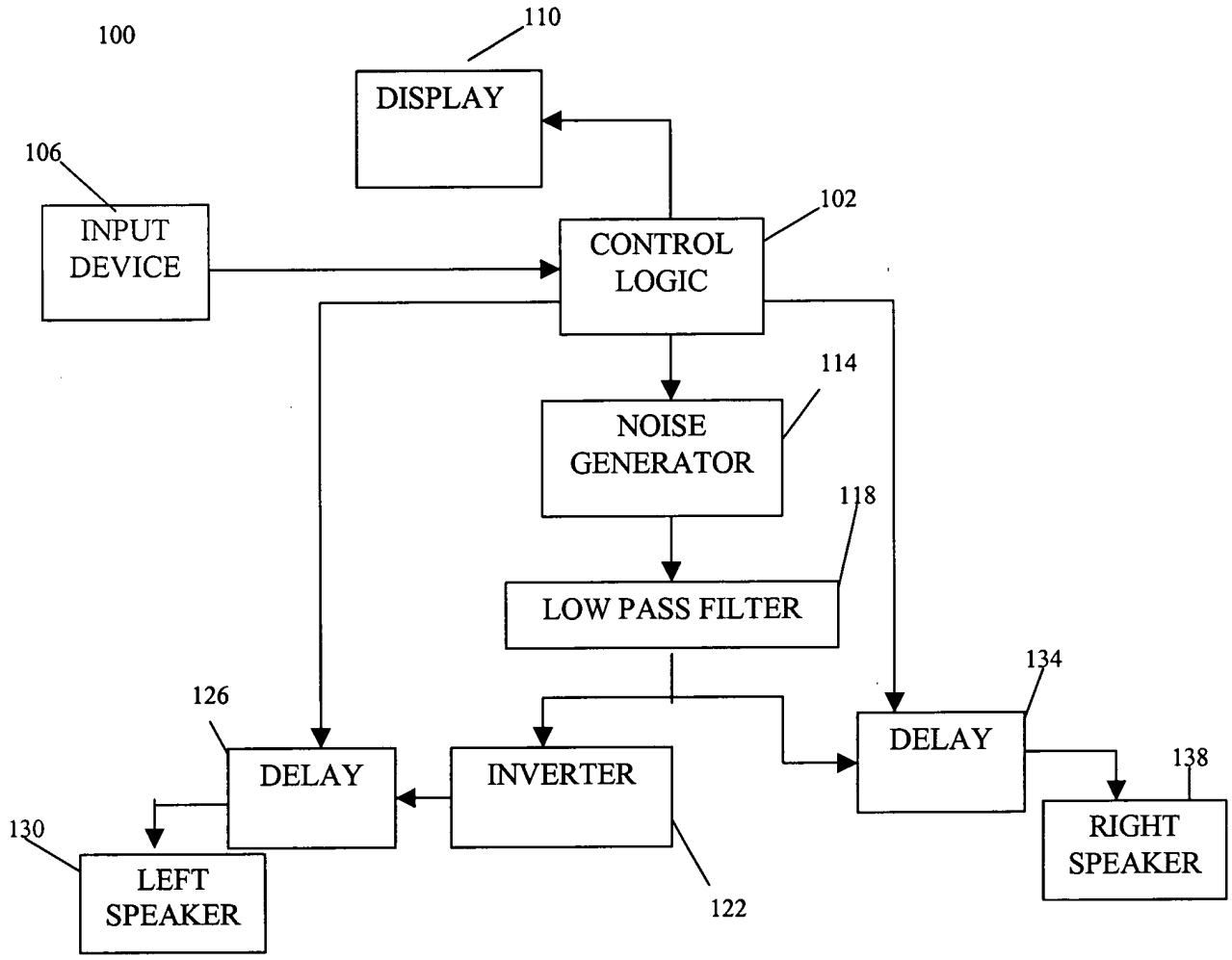

FIG. 1

SUMMARY OF THE INVENTION

Applicant's invention generally relates to an audio calibration system and more particularly to a technique for calibrating an audio system for any desired listening location. The invention can be described with reference to FIG. 1 of the specification, reproduced above.

The invention of claim 1 is directed to, among other things, an audio calibration system comprising a control logic (102), a display (110), a noise generator (114), a plurality of speakers (130, 138), and a delay module (126, 134) coupled to each speaker.

To further clarify the invention, Claim 1 and FIG. 1 are reproduced below.

1. (Previously Amended) An audio calibration system, comprising:

a control logic;

an input device coupled to said control logic;

a display coupled to said control logic;

a noise generator for generating a substantially random noise signal and coupled to said control logic;

a plurality of speakers coupled to said noise generator; and

delay modules coupled between said noise generator and said plurality of speakers for introducing time delays in the sound produced by the speakers,

wherein said control logic causes said display to display a visual image that indicates the relative position of a null line, wherein the position of the null line is determined by the time delays of the

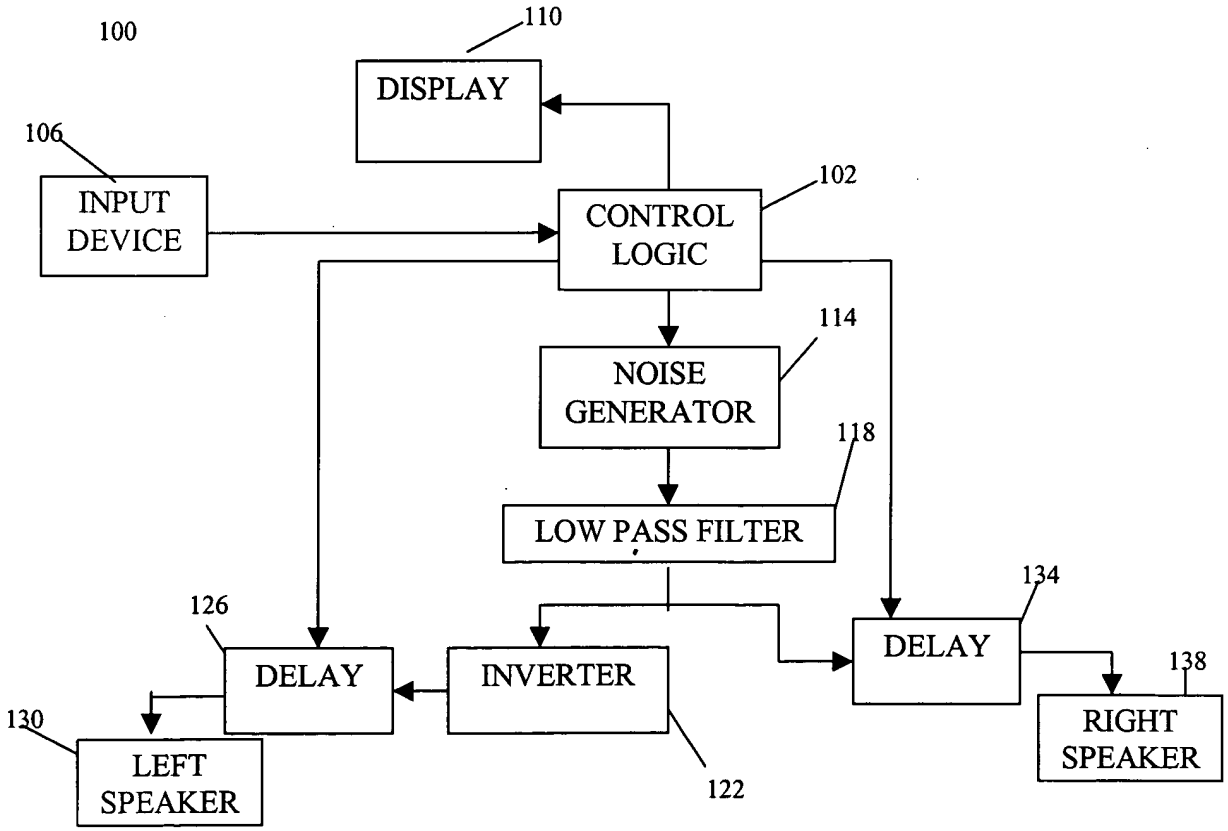

FIG. 1

delay modules.

Claim 1 further recites that display (110) is capable of displaying a visual image that indicates the relative position of a null line. This may be made clear with reference to FIG. 6, below.

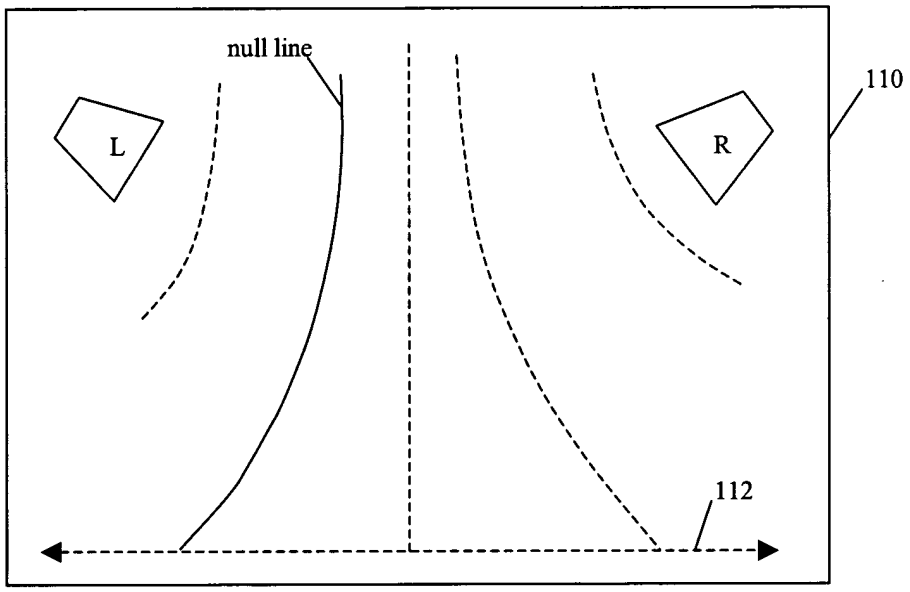

FIG. 6

PRIOR PROCEEDINGS

In the Final Office Action mailed December 1, 2003, the Examiner rejected claims 1-4, 6-14, 16-18, 20 and 21 under 35 U.S.C. § 103(a) as being allegedly unpatentable over Plunkett (US 5,386,478) in view of Dunlavy (US 5,778,087).

SUMMARY OF CITED ART

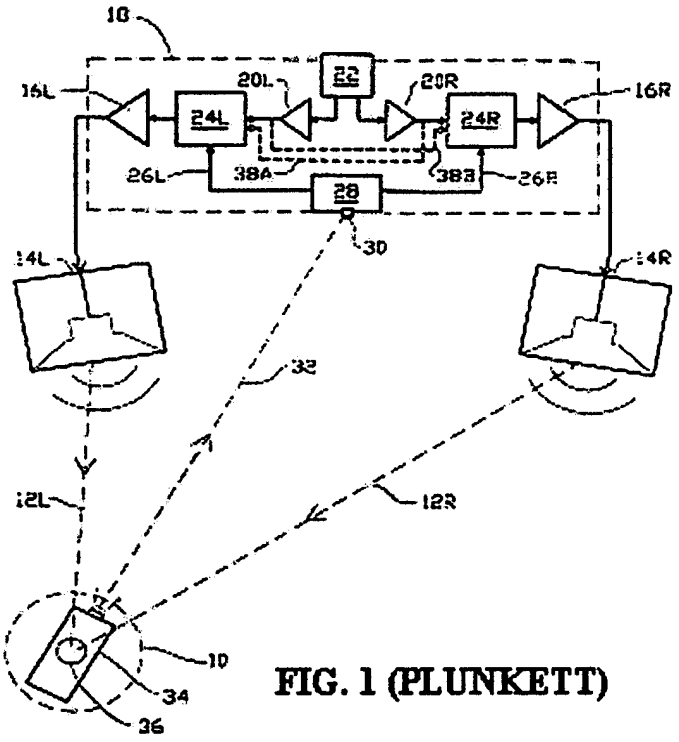

FIG. 1 (PLUNKETT)

U.S. PAT. NO. 5,386,478 ("Plunkett")

Plunkett teaches automatic stereo adjustment by incorporating an acoustic sensor in a hand-held remote control unit. The microphone, which is located at the listening location, picks up a special test signal generated from the loudspeakers on command; then, based on analysis of the signal picked up by the microphone, corrective adjustment of the stereo unit is introduced. Col. 1-2, lines 60-6.

FIG. 1 (PLUNKETT), above, is a simplified functional block diagram of a stereo system equipped to operate in accordance with the invention of Plunkett. The exemplary stereo system

depicted in FIG. 1 comprises channel control modules 24L and 24R, command module 28 and remote control unit 34 at listening location 10.

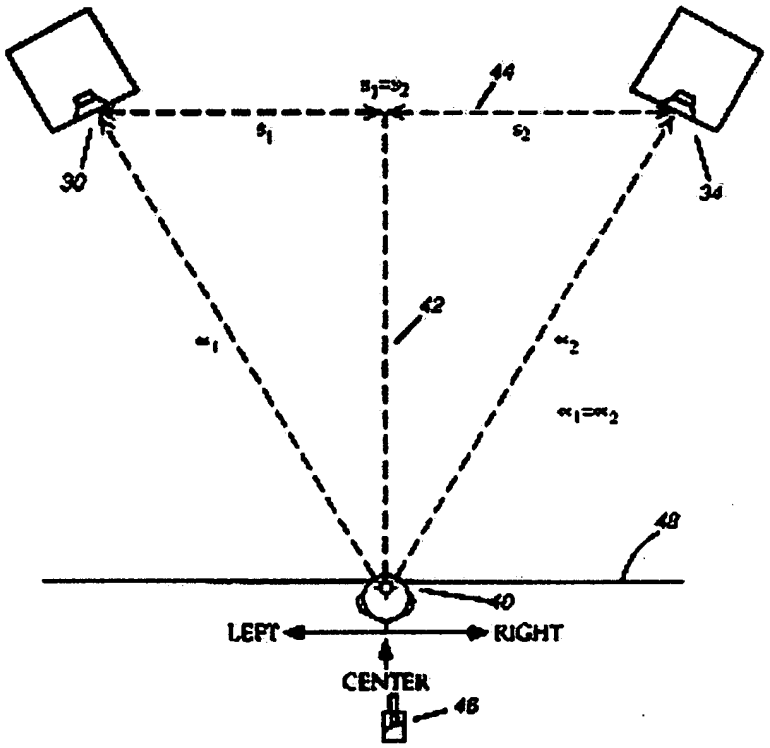

FIG. 4 (DUNLAVY)

U.S. PAT. NO. 5,778,087 ("Dunlavy")

Dunlavy teaches a method for stereo loudspeaker placement. The method consists of, in part, applying an acoustic signal to a set of loudspeakers, measuring the combined sound level of the acoustic signals at the principal listening location, and adjusting the location of the loudspeakers to ensure that they are acoustically-equidistant from the principal listening position.

The invention of Dunlavy may be made clear with reference to FIG. 4 (DUNLAVY), shown above. FIG. 4 (DUNLAVY) is a schematic depicting left and right stereo speakers (30 and 34, respectively) in relation to a principal listening position 40. Dunlavy further teaches a set-up indicator 46 to measure the combined sound level at principal listening position 40 created by loudspeakers 30 and 34. Dunlavy also teaches a stereo reproduction system having connections that ensure that the acoustic signals radiated by both loudspeakers are "out-of-phase" relative to each other, as depicted in FIG. 3-B (DUNLAVY), below.

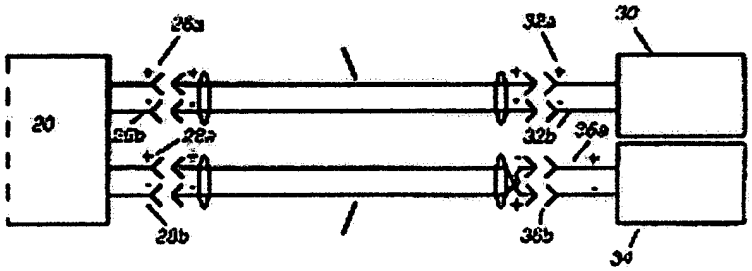

FIG. 3-B (DUNLAVY)

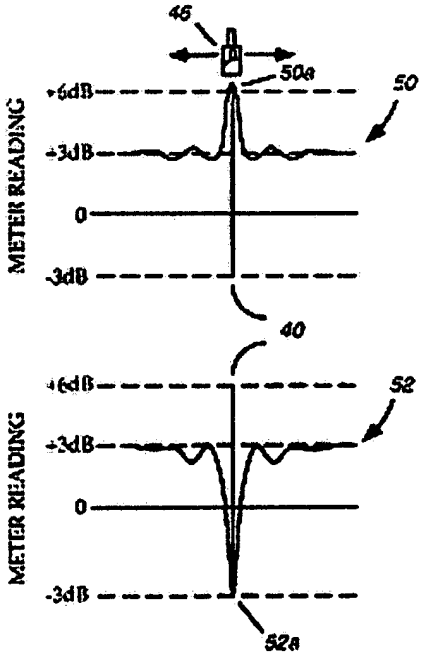

FIG. 5 (DUNLAVY)

FIG. 5 (DUNLAVY), shown above is a graph depicting the variations in signal amplitude measured by the indicator 46.

ISSUES

A prima facie case of obviousness requires, among other things, that the prior art reference (or references when combined) must teach or suggest all the claim limitations. Has the examiner indeed established a case of prima facie obviousness in the rejection of claims 1-4, 6-14, 16-18, 20 and 21?

GROUPING OF CLAIMS

Claims 1-4, 6, 18, 20 and 21 stand together.

Claims 7-14 stand together.

Claims 16 and 17 stand together.

ARGUMENT

Claims 1-4, 6, 18, 20 and 21

To make a rejection under § 103, the examiner must establish a prima facie case of obviousness. *See* MPEP 2142.

> To establish a prima facie case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations.

Also see MPEP 2143.03.

> To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981,

> 180 USPQ 580 (CCPA 1974). "All words in a claim must be considered in judging the patentability of that claim against the prior art." *In re Wilson*, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970). If an independent claim is nonobvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious. *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988).

Id (emphasis added). Applicants respectfully submit that the examiner has not established a prima facie case of obviousness because the cited art does not teach or suggest all the claim limitations.

Independent claim 1 recites an audio calibration system "wherein said control logic causes said display to display a visual image that indicates the relative position of a null line, wherein the position of the null line is determined by the time delays of the delay modules". As stated above, prima facie obviousness requires a showing that the references when combined teach or suggest all the claim limitations. As the examiner concedes, Plunkett fails to show any display. (See Final Office Action; page 2, para. 1). Rather, the examiner cites Dunlavy's indicator 46 (see FIG. 4 (DUNLAVY), shown above and described in Col. 3, lines 60-67), characterizing it as a sound level meter and further equating such a meter to a visual indicator for determining the null. The specification describes the indicator as a conventional meter capable of measuring combined sound levels. The specification does not describe indicator 46 as a display for indicating the relative position of a null line. One of ordinary skill would regard such a conventional sound level meter as giving only an indication of the sound level at a given point. This is made clear in FIG. 5 (DUNLAVY) which shows a graph that represents the variations in signal amplitude measured by indicator 46 (Col. 3, lines 4-6). As implied by the arrows to the left and right of indicator 46, graph 50 represents an aggregate of data acquired by moving indicator 46 about principal listening position 40. Col. 4, lns. 1-30.

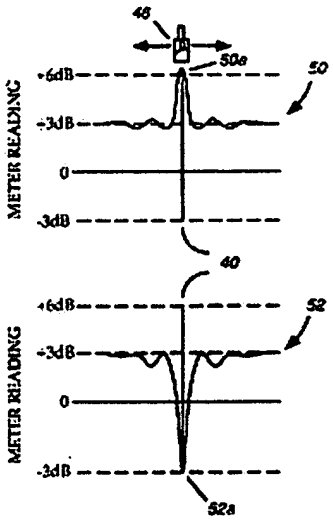

FIG. 5 (DUNLAVY)

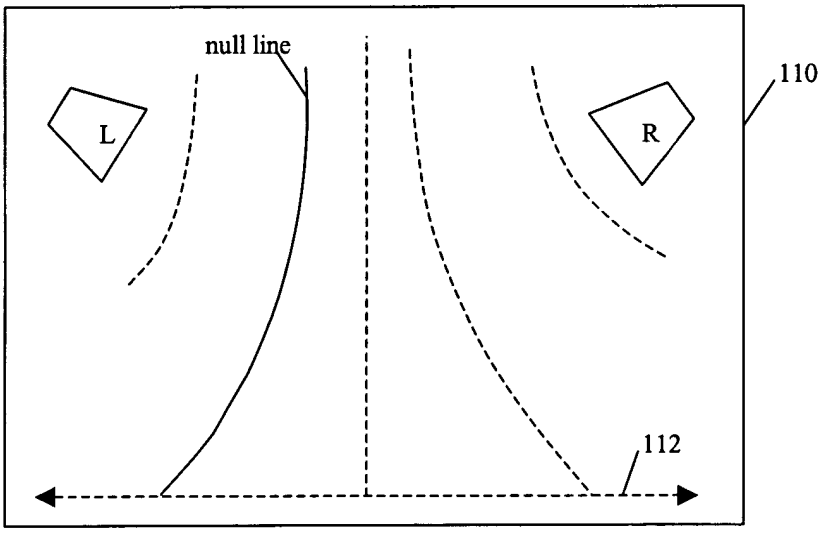

FIG. 6

By contrast, applicant's FIG. 6 shown above is a visual image that does indicate the relative position of a null line. FIG. 6 is shown on display 110 (also visible in applicant's FIG. 1, above) to illustrate the relative location of a null line.

Therefore, applicant asserts that the combined teachings of Dunlavy and Plunkett do not teach nor suggest a display to display a visual image that indicates the relative position of a null line." For at least this reason, applicant asserts that independent claims 1, 18 and 20; and dependent claims 2-4, 6 and 21 are believed to be allowable over the cited art.

Claims 7-14

Independent claim 7 recites and FIG. 1 (above) shows "an inverter coupled between said noise generator and at least one delay module". Plunkett does not teach an inverter coupled between a noise generator and a delay module. To anticipate this limitation, the examiner cites Dunlavy's "out-of-phase" wiring configuration in which two speaker wires are crossed over as shown in FIG. 3-B (DUNLAVY) above and reproduced below. With reference to FIG. 3-B (DUNLAVY) below and FIG. 4 (DUNLAVY) above, the Examiner maintains that the crossed wires at 36a and 36b shows the inverter located between a noise generator (20) and a delay consisting of the space between the speakers 30 and 34 and a microphone (listening position 40 of FIG. 4 (DUNLAVY) above. Final Office Action; Page 3, para. 2. As Dunlavy's specification does not refer to a microphone, applicant can only assume that the examiner refers to the space between the loudspeakers 30 and 34 and the listener at the preferred listening position 40 of FIG. 4 (DUNLAVY), shown above.

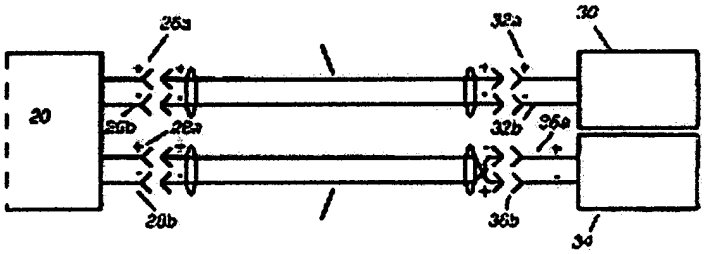

FIG. 3-B (DUNLAVY)

Applicant asserts that the space between loudspeakers 30 and 34 and principal listening position 40 of Dunlavy is distinct from delay modules for introducing time delays in the sound produced by the speakers as recited in applicant's claim 7. As such, Dunlavy cannot teach an inverter between a noise generator and a delay module because the examiner has not shown that Dunlavy teaches the delay module that the examiner has alleged.

Therefore, because the combined references do not teach or suggest all the claim limitations, the examiner has failed to make a prima facie case of obviousness and applicant asserts that independent claims 7, 9 and its dependent claims 8 and 10-14 are allowable over the cited art.

Claims 16 and 17

Claims 16 and 17 both recite a method for calibrating an audio system including multiple speakers. Both claims are directed toward, among other things, an iterative method of adjusting a null line caused by multiple speakers by adjusting the null line caused by pairs of speakers. Claim 16 reads:

> 16. A method for calibrating an audio system including multiple speakers, comprising:
>
> providing substantially random noise to a reference speaker and a first speaker;
>
> tuning a time delay to one of the speakers provided with substantially random noise to adjust the location of a null line caused by said reference and first speakers;
>
> providing substantially random noise to said reference speaker and a second speaker; and
>
> tuning a time delay to one of the reference or second speakers to adjust the location of a null line caused by said reference and second speakers.

Although both Plunkett and Dunlavy acknowledge that their respective inventions can be used in stereo systems having more than two channels, neither Plunkett, Dunlavy or the combined teaching of both references teach how to adjust the location of a null line for a second and third speakers. Plunkett only goes so far as to teach a high priced sophisticated stereo system with a

remote control. The examiner attempts to close the gap between the cited references and applicant's invention by referring to a well known surround sound home theater system usually comprising a sophisticated stereo audio system having more than two speakers controlled by a universal remote control. The examiner alleges that for a surround sound system involving more than two speakers, it would be obvious to one skilled in the art to calibrate third, fourth and fifth speakers.

According to MPEP 2144.03,

> It is never appropriate to rely solely on "common knowledge" in the art without evidentiary support in the record, as the principal evidence upon which a rejection was based. *Zurko*, 258 F.3d at 1385, 59 USPQ2d at 1697 ("[T]he Board cannot simply reach conclusions based on its own understanding or experience-or on its assessment of what would be basic knowledge or common sense. Rather, the Board must point to some concrete evidence in the record in support of these findings."). While the court explained that, "as an administrative tribunal the Board clearly has expertise in the subject matter over which it exercises jurisdiction," it made clear that such "expertise may provide sufficient support for conclusions [only] as to peripheral issues." *Id.* at 1385-86, 59 USPQ2d at 1697. As the court held in *Zurko*, an assessment of basic knowledge and common sense that is not based on any evidence in the record lacks substantial evidence support. *Id.* at 1385, 59 USPQ2d at 1697. See also *In re Lee*, 277 F.3d 1338, 1344-45, 61 USPQ2d 1430, 1434-35 (Fed. Cir. 2002) (In reversing the Board's decision, the court stated " 'common knowledge and common sense' on which the Board relied in rejecting Lee's application are not the specialized knowledge and expertise contemplated by the Administrative Procedure Act. Conclusory statements such as those here provided do not fulfill the agency's obligation. The board cannot rely on conclusory statements when dealing with particular combinations of prior art and specific claims, but must set forth the rationale on which it relies."). (Emphasis added)

Applicant respectfully asserts that the examiner has incorrectly relied on "common knowledge" without evidentiary support as the basis for his or her rejection. Applicant can find no teaching in Dunlavy and/or Plunkett that suggests a method for audio system calibration comprising providing noise to a first pair of speakers, adjusting the null line by turning a time delay and repeating for a second pair of speakers. The examiner inappropriately relies on a surround sound home theater system comprising more than two speakers controlled by a universal remote control. Applicant has previously requested evidentiary support upon which the examiner's

assertions are based. To date, the examiner has provided no such evidence upon which the examiner's rejections are effectively based.

Moreover, even if for the sake of argument it is acceptable to invoke a surround sound home theater system comprising more than two speakers as done by the examiner, applicant asserts that a prima facie case of obviousness has not been made. In particular, the combined references fail to teach all the claim limitations. To wit, it has not been shown that the teachings of Dunlavy, Plunkett and a surround sound home theater system would obviously suggest to the skilled artisan the method comprising providing substantially random noise to a first speaker pair; adjusting the location of a null line so generated by tuning a time delay; and repeating the method for a second speaker pair.

Applicant asserts that for at least the reasons cited above independent claim 16 and dependent claim 17 are allowable over the cited prior art.

In view of the arguments set out above, applicant respectfully requests that the 35 USC 103(a) rejection by reversed by the Board. If any fees are inadvertently omitted or if any additional fees are required or have been overpaid, please appropriately charge or credit those fees to LSI Logic Deposit Account Number 12-2252/5201-19401/DJK.

Respectfully submitted,

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APPENDIX

Listing Of The Claims

1. An audio calibration system, comprising:

a control logic;

an input device coupled to said control logic;

a display coupled to said control logic;

a noise generator for generating a substantially random noise signal and coupled to said control logic;

a plurality of speakers coupled to said noise generator; and

delay modules coupled between said noise generator and said plurality of speakers for introducing time delays in the sound produced by the speakers,

wherein said control logic causes said display to display a visual image that indicates the relative position of a null line, wherein the position of the null line is determined by the time delays of the delay modules.

2. The audio calibration system of claim 1 wherein the substantially random noise signal has an auto correlation of 0.

3. The audio calibration system of claim 1 wherein the substantially random noise signal is pseudo-random.

4. The audio calibration system of claim 1 wherein said plurality of speakers includes five speakers.

5. Canceled.

6. The audio calibration system of claim 1 wherein said input device is wirelessly coupled to said control logic.

7. An audio calibration system, comprising:

a control logic;

an input device coupled to said control logic;

a display coupled to said control logic;

a noise generator for generating a substantially random noise signal and coupled to said control logic;

a plurality of speakers coupled to said noise generator;

delay modules coupled between said noise generator and said plurality of speakers for introducing time delays in the sound produced by the speakers; and

an inverter coupled between said noise generator and at least one delay module.

8. The audio calibration system of claim 7 further including a low pass filter coupled between said noise generator and said delay modules for low pass filtering the noise signal.

9. An audio calibration device, comprising:

a control logic;

an input device coupled to said control logic;

a noise generator for generating a substantially random noise signal and coupled to said control logic;

a low pass filter coupled to said noise generator for filtering the random noise signal from said noise generator;

an inverter coupled to said low pass filter;

a first delay module coupled to said inverter for introducing a time delay into an output signal from said inverter; and

a second delay module coupled to said low pass filter for introducing a time delay into an output signal from said filter, wherein said control logic controls the amount of time delay introduced by each delay module to thereby vary the location of a null line.

10. The audio calibration device of claim 9 further including a display unit coupled to the control logic for displaying a visual image indicative of the relative location of the null line.

11. The audio calibration device of claim 10, wherein said display unit includes an on-screen display controller implemented in a DVD decoder.

12. The audio calibration device of claim 10 further including a sound detector coupled to said control logic, said control logic determines the presence of the null line by processing an audio signal from said sound detector.

13. The audio calibration device of claim 10, wherein said noise generator and low pass filter are implemented using digital signal processing.

14. The audio calibration system of claim 10 further including speakers respectively coupled to said delay modules.

15. Canceled.

16. A method for calibrating an audio system including multiple speakers, comprising:

providing substantially random noise to a reference speaker and a first speaker;

tuning a time delay to one of the speakers provided with substantially random noise to adjust the location of a null line caused by said reference and first speakers;

providing substantially random noise to said reference speaker and a second speaker; and

tuning a time delay to one of the reference or second speakers to adjust the location of a null line caused by said reference and second speakers.

17. The method of claim 16 further including:

providing substantially random noise to said reference speaker and a third speaker; and

tuning a time delay to one of the reference or second speakers to adjust the location of a null line caused by said reference and third speakers.

18. A method for calibrating an audio system including multiple speakers, comprising:

providing substantially random noise to a reference speaker and a first speaker; and

tuning a time delay to one of the speakers provided with substantially random noise to adjust the location of a null line caused by said reference and first speakers, wherein said tuning step includes:

receiving an audio signal from a microphone; and

processing said audio signal to determine a minimum amplitude level.

19. Canceled.

20. An audio calibration system, including:

a means for generating a substantially random noise signal;

a delay means coupled to said noise signal generating means for introducing time delays in the substantially random noise signal;

a means for controlling the amount of time delay introduced by said delay means to control the location of a null point; and

a filtering means coupled to said noise signal generating means for low pass filtering the substantially random noise signal.

21. The audio calibration system of claim 20 further including a means for displaying the relative location of the null point.